PLICATION PUBLISHED UNDER THE PATENT



(19) World Intellectual Property **Organization** International Bureau



## ) (1918 - 1919) (1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 19

(43) International Publication Date 21 May 2004 (21.05.2004)

PCT

## (10) International Publication Number WO 2004/041970 A1

(51) International Patent Classification7:

C10G 2/00

(21) International Application Number:

PCT/EP2003/012166

(22) International Filing Date: 30 October 2003 (30.10.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

02079646.2 60/427,408

5 November 2002 (05.11.2002) EP 19 November 2002 (19.11.2002)

(71) Applicant (for all designated States except US): AKZO NOBEL N.V. [NL/NL]; Velperweg 76, NL-6824 AB Arnhem (NL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): SYEENWINKEL, Edgar, Evert [NL/NL]; Gedempte Voldersgracht 18, NL-2011 WD Haarlem (NL). SPEE, Marieke, Paulyne, Rénate [NL/NL]; Texel 95, NL-3524 AS Utrecht (NL), VERLAAN, Johannes, Petrus, Jozef [NL/NL]; Keurkampstraat 22, 7415 DL Deventer (NL). VOGT, Eelco, Titus, Carel [NL/NL]; Postmastraat 16, 4,05 DW Culemborg (NL).

- (74) Agent: SCHALKWIJK, Pieter, Cornelis; Akzo Nobel N.V., Intellectual Property Dept. (Dept. AIP), P.O. Box 9300, NL-6800 SB Arnhem (NL).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

## Published:

with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: FISCHER-TROPSCH PROCESS USING A FISCHER-TROPSCH CATALYST AND A ZEOLITE-CONTAINING **CATALYST** 

(57) Abstract: Fischer-Tropsch process for the conversion of carbon monoxide and hydrogen to C<sub>5</sub>+ hydrocarbon mixtures in which process use is made of Fischer-Tropsch catalyst particles and fluid catalytic cracking (FCC) catalyst particles. The FCC catalyst can be a fresh FCC catalyst, or an equilibrium catalysts (E-cat).

A. CLASSI IPC 7	FICATION OF SUBJECT MATTER C10G2/00		·
<b>.</b>			
	International Patent Classification (IPC) or to both national classific	ation and IPC	
	SEARCHED currentation searched (classification system followed by classification)	on symbols)	
IPC 7	C10G	on symbols)	
Documentar	ion searched other than minimum documentation to the extent that s	such documents are included in the fields se	arched
Electronic d	ata base consulted during the international search (name of data ba	se and, where practical, search terms used)	
EPO-In	ternal, WPI Data, PAJ		
C. DOCUME	ENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the rel	evant passages	Relevant to claim No.
X	US 4 906 671 A (HAAG WERNER O (US 6 March 1990 (1990-03-06) claims 1,11,12,16,17,19,20	S) ET AL)	1,2,6-8
	column 11, line 31 - line 36		·
X	US 3 254 023 A (MIALE JOSEPH N ET	f AL)	1,2,7,8
	31 May 1966 (1966-05-31) claims 1,13,17,19		
	column 3, line 60 - column 4, lir	ne 4	
A	US 5 928 980 A (JOTHIMURUGESAN KA (US) ET AL) 27 July 1999 (1999-07 cited in the application claims 1,12,13 column 3, line 63 - column 4, lin	1,5,7-10	
			•
<u> </u>	ner documents are listed in the continuation of box C.	X Patent family members are listed i	n annex.
° Special car	tegories of cited documents:	*T* later document published after the inter	national filing date
consid "E" earlier o	nt defining the general state of the art which is not ered to be of particular relevance locument but published on or after the international	or priority date and not in conflict with to cited to understand the principle or the invention	ory underlying the
filing d. "L" docume	ate nt which may throw doubts on priority claim(s) or	"X" document of particular relevance; the ci cannot be considered novel or cannot involve an inventive step when the doc	be considered to
which i	is cited to establish the nublication date of enother	"Y" document of particular relevance; the ci cannot be considered to involve an inv	aimed invention
*O* docume other n	ent referring to an oral disclosure, use, exhibition or neans	document is combined with one or more ments, such combination being obviou	re other such docu-
*P* docume later th	nt published prior to the international filing date but an the priority date claimed	in the art.  *&* document member of the same patent f.	•
Date of the s	actual completion of the international search	Date of mailing of the international sea	rch report
2!	5 February 2004	05/03/2004	
Name and m	nailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2	Authorized officer	
	NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,	De Herdt O	



Information on patent family members

Internat	Pication No
PCT/EP	03/12166

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 4906671	Α	06-03-1990	GB ZA	2179670 A 8605840 A	11-03-1987 30-03-1988
US 3254023	Α	31-05-1966	NONE		
US 5928980	Α	27-07-1999	NONE		